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Myopsocidae (Insecta : Psocoptera) from Java, including a discussion of the known Indonesian fauna

by

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With 27 figures

ABSTRACT

The myopsocid fauna of Indonesia, in particular Java, is reviewed, based on a study of recent collections from Java. Twenty-one species are now known from Indonesia, 9 of *Myopsocus*, 4 of *Lichenomima*, 4 of *Lophopterygella*, 1 of *Mouldsia*, and 3 of a newly erected genus, *Smithersia*. Fourteen of these species (5 *Myopsocus*, 4 *Lichenomima*, 4 *Lophopterygella* and 1 *Smithersia*) are known from Java. The species *Lichenomima merapi*, *Myopsocus spatulatus* and *Smithersia newi* are described and *Myopsocus angustus* Vaughan *et al.* and *Myopsocus hermosoides* Vaughan *et al.* are transferred to *Smithersia*, for which *Psocus hermosus* (Banks) is designated the type species and a diagnosis provided. Keys are provided for Indonesian genera of the family, for Indonesian species of *Myopsocus* and *Lophopterygella*, and for species of *Smithersia*. Problems of generic limits within the family are raised and discussed.

INTRODUCTION

MACKINNON (1988) has concisely summarised the features of the biological province of Java, which comprises the islands of Java, Madura and Bali (only 3 km from Java), their satellite islands and a number of small island groups in the Java Sea, and is part of the Sundaic subregion. Many of Mackinnon's points are drawn upon below.

The Indo-Australian plate underthrusts the Asian plate resulting in a deep submarine trench parallel to Java's southern coast; the chain of volcanoes, several of them active, along the southern part of Java is a consequence of this tectonic process. Madura and Bali were joined to Java as a result of lowered sea levels (as much as 100m) during the Pleistocene ice ages (3 million to 8000 years ago), and for considerable periods all the Greater Sunda Islands (Java, Sumatra and the island of Borneo) were part of continental Asia.

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In the west of Java, lush tropical rain forests reflect a year-round wet climate, the Bogor area, for example, being one of the wettest in the world. The Javan climate becomes drier towards the east. Forests in East Java, where there is a dry season from May to October, are largely less rich deciduous monsoon forests (particularly evident in the north-east). Mackinnon notes that these more seasonal eastern areas of Java support a flora more similar to that north of the Kra isthmus of the Malayan peninsula, and have probably been responsible for the survival on Java, but not on Sumatra, Borneo or the southern Malayan peninsula, of a number of Asian birds of open wooded country. The northern coast also experiences more seasonal rainfall than the west or the southern coast. The mountains, many of which are over 3000 m in height (the highest, Gunung Semeru, being 3676m) are of course wetter than more low-lying country. Volcanic disturbance prevents the attainment of climax vegetation on the high ground of the active volcanoes, where one finds *Casuarina* forest rather than the richer flora of the less active volcanoes.

Java and Bali are among the most densely populated regions in the world (over 100 million people inhabit the two islands), a consequence of the fertile volcanic soils, good rainfall and warm climate, and most land that remains undisturbed (about 10%) is on the high volcanic slopes. Lowland rainforest has been reduced to less than 3% of its original extent and is now rare. Nevertheless, about 100 reserved areas, of varying status, have been established on Java and some of these, such as Ujung Kulon, Gunung Gede-Pangrango, Bromo-Tengger, Meru Betiri, and Baluran, are quite extensive national parks.

This is the first of a series of papers on Javan Psocoptera based on a study of recent collections. Collecting sites are shown in Fig. 1 and are listed, with collectors, month and year, below (abbreviations as in Fig. 1):

West Java

Ujung Kulon National Park (UK in Fig. 1): IWBT, Nov-Dec 1982; Mr P.J. Vaughan Apr-May 1984; PJV, IWBT and Dr T.R. New Aug-Sep 1984.

Krakataus (KA): IWBT Nov 1982, Sep 1983; IWBT, TRN, PJV, Aug-Sep. 1984, Aug 1985; TRN, IWBT, Sep 1986; IWBT Feb 1986.

Carita area (CA): PJV Apr-May 1984; IWBT, PJV and TRN Aug-Sep 1984, Aug 1985; IWBT, TRN Oct 1986.

Kebun Raya, Bogor (BO): Dr Peter van Doesburg, Nov-Dec 1986, Sep 1977; IWBT Dec 1982, Feb 1988, Feb 1987; PJV Apr 1984; IWBT, TRN Oct 1986; Dr C. Lienhard, Nov 1987.

Gunung Gede- Pangrango, Cibodas area (CI): IWBT, TRN Oct 1986; IWBT Feb 1987; CL Nov 1987; Lobl, Agosti and Burckhardt Nov 1989.

Bandung area (BA): IWBT Feb 1987, Jan 1988.

Penanjun Wildlife Reserve, Pangandaran (PA): IWBT Feb 1987.

Central Java (IWBT Jan 1988)

Gunung Slamet, Baturaden area (GS); Dieng Plateau, Gunung Perahu (DP); Borobudur (BB); Gunung Merapi, Kaliurang area (GM); Prambanan (PR); Yogyakarta (YO).

East Java (IWBT Jan 1988)

Gunung Lawu, Sarangan area (GL); Gunung Arjuna, Gunung Welirang and Selekta area (GA); Singosari area (SI).

Madura Island, near Sumenep (MA): Dr D. Reid Jan 1980.

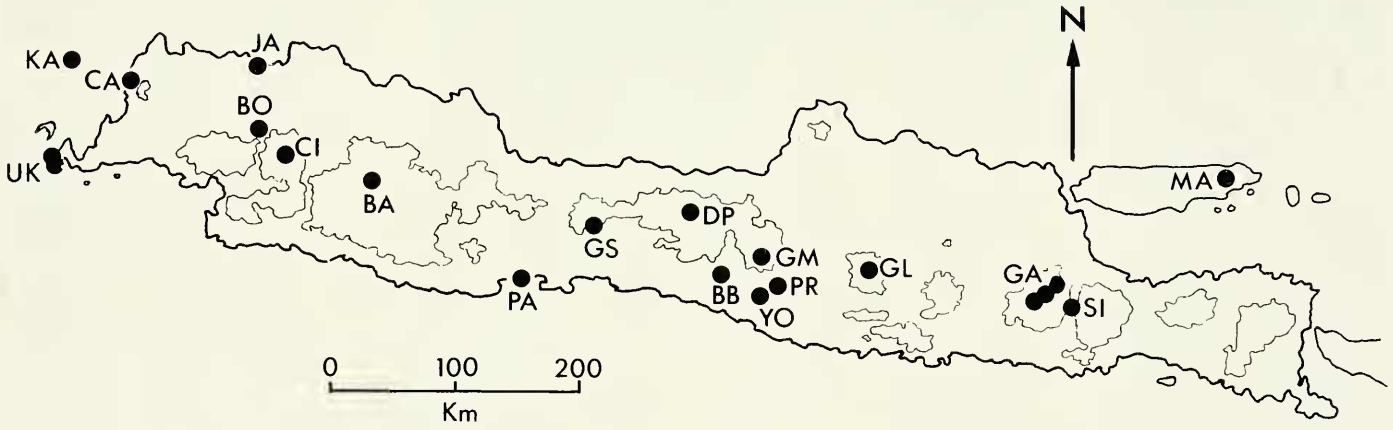


FIG. 1.

Java and adjacent islands, showing 500 m contour and collecting sites. BA Bandung area, BB Borobudur area, BO Bogor area, CA Carita area, CI Cibodas - Gunung Pangrango - Gunung Gede, DP Dieng Plateau, GA Gunung Arjuna - Gunung Welirang, GL Gunung Lawu, GM Gunung Merapi, GS Gunung Slamet, JA Jakarta area, KA Krakatau Archipelago, Ujung Kulon National Park, MA Madura Island, PA Penangun Wildlife Reserve, PR Prambanan area, SI Singosari area, YO Yogyakarta area, UK Ujung Kulon peninsula, Ujung Kulon National Park.

The treatment will be by families and, although the focus is on the fauna of Java, for convenience we also note species recorded from other parts of the Indonesian archipelago. This paper deals with the Myopsocidae. For the benefit particularly of Indonesian entomologists and ecologists, we provide a key to genera of Myopsocidae known from Indonesia, and for two genera a field key to known Indonesian species, based predominantly on characters not requiring dissection. Authorship of new species described in this paper should be ascribed to Thornton. Holotype and allotype specimens will be deposited in the Zoology Museum, Bogor (ZMB), paratypes in the Australian Museum, Sydney (AM), and other specimens in the Muséum d'Histoire naturelle, Geneva (MHNG).

THE FAMILY MYOPSOCIDAE

The Myopsocidae comprises medium to fairly large psocopterans (fore wing length 4.0 to 7.0mm) that in general are corticolous and feed on epiphytic fungi and lichens on the surface of bark. Many species have mottled or disruptively patterned fore wings, rendering them inconspicuous when resting on lichen-covered bark. In Indonesia they appear to be true forest insects, and tend to occur in greater diversity at middle to high elevations. Four genera of the family are represented in the New Guinea area where one line of *Myopsocus* has diversified (SMITHERS & THORNTON 1974), penetrating the Melanesian arcs (SMITHERS & THORNTON 1979) and speciating considerably on the Fiji Archipelago (THORNTON 1981, SMITHERS & THORNTON 1981).

Classification of the family, in particular the genera *Myopsocus* Hagen, 1866, *Rhaptoneura* Enderlein, 1910, *Phlotodes* Enderlein, 1910 and *Lichenomima* Enderlein, 1910, has been confused for some decades; some clarification has recently been made, and more is needed. MOCKFORD (1982) re-diagnosed the genus *Myopsocus* on the basis of an examination of the type specimen of *Psocus unduosus* Hagen from Sri Lanka, the type species of *Myopsocus*. In doing so he corrected an error of ENDERLEIN (1910:68) concerning *unduosus*, and showed that in this species veins rs and m are fused for a distance in the hind wing, not joined by a cross-vein as stated by Enderlein. Thus Mockford proposed that *Lichenomima* (hind wing veins rs and m joined by a cross-vein), for which he provided an augmented diagnosis, should not be synonymised under *Myopsocus* as had been the practice since Roesler's paper (ROESLER 1944) but should probably stand as a separate genus; in contrast, *Rhaptoneura* and *Phlotodes* (rs and m fused in the hind wing) were synonymised with *Myopsocus*.

As a result of Mockford's finding, MOCKFORD (1982) and SMITHERS (1985) reassigned to *Myopsocus* 74 species originally placed in or previously transferred to *Phlotodes* and *Psocus* Latreille, 1794, and to *Lichenomima* 15 species from the genera *Myopsocus*, *Psocus* and *Amphigerontia* Kolbe, 1880. Mockford noted that *Lichenomima medialis* (Thornton), which on the basis of hind wing venation he transferred to *Lichenomima*, appeared to be so unusual in several other features as to merit a distinct genus.

The following treatment follows Mockford's recommendations, although some points raised in the discussion suggest that generic placement in the family is still far from satisfactorily resolved.

SOEHARDJAN (1958) listed only 6 myopsocids from Indonesia: *Myopsocus kolbei* Enderlein, 1903 from Irian Jaya (Indonesian New Guinea), *Myopsocus longigena* (Enderlein, 1926) from Java, and *Myopsocus mjorbergi* (Karny, 1925) from Kalimantan (Indonesian Borneo); *Lichenomima fenestrata* Enderlein, 1926 from Java and

Lichenomima sumatrana (Enderlein, 1907) from Java and Sumatra; and *Lophopterygella camelina* Enderlein, 1907 from Java [and this species was also doubtfully recorded from western Java by VAUGHAN *et al.* (1991)]. SMITHERS AND THORNTON (1974) described *Lichenomima ampla*, *Myopsocus dentatus* and *Mouldsia inocellata* from Irian Jaya. THORNTON (1984) described *Lophopterygella antennalis* and *Myopsocus apicalis* from Bali, and *Myopsocus lombokensis* from Lombok. VAUGHAN *et al.* (1991) described *Myopsocus corticola* and *Myopsocus javensis* from the western coast of Java and *Myopsocus hermosoides*, *Myopsocus angustus* and *Lophopterygella ridderi* from southern Sumatra. *Lophopterygella camelina* and another undescribed species of this genus were recorded from the Krakatau Islands, Sunda Strait, by VAUGHAN *et al.* (1989). In the present paper the following species additional to the above are recorded from Java: *Myopsocus spatulatus* n.sp., *Lichenomima ampla*, *Lichenomima merapi* n.sp., and *Smithersia newi* n.sp. Two species, *M. hermosoides* and *M. angustus*, are transferred to the new genus *Smithersia*. Thus 20 species (or 21, depending on the locality of *Myopsocus loriai* Ribaga, see below) of the family are now known from Indonesia, 8 (or 9) of *Myopsocus*, 4 of *Lichenomima*, 3 of *Smithersia*, 4 of *Lophopterygella* Enderlein, 1907, and one of *Mouldsia* Smithers, 1978; 14 of these are known from Java.

KEY TO INDONESIAN GENERA OF MYOPSOCIDAE

1. Veins rs and m in hind wing fused for a distance (e.g. fig. 11) 2
   Veins rs and m in hind wing joined by a cross-vein (e.g. fig. 6) 4
2. Ocelli present, fore wing shape normal 3
   Ocelli absent, fore wing narrow ..... *Mouldsia*
3. Phallosome without posterior U-shaped extension, female subgenital plate with narrow tapering terminal process bearing apical setae ..... *Myopsocus*
   Phallosome with posterior U-shaped extension, female subgenital plate sclerotized, complex, with lateral groups of long narrow spines ..... *Smithersia*
4. Fore wing margin scalloped apico-posteriorly; hypandrium sclerotized, with short, broad, apical lobe; female subgenital plate with short, broad, tuncate, apical lobe ..... *Lophopterygella*
   Fore wing margin smoothly rounded apico-posteriorly; hypandrium simple, no distinct apical lobe; female subgenital plate with transverse distal sclerite ..... *Lichenomima*

SPECIES OF MYOPSOCIDAE KNOWN FROM INDONESIA

Genus **Lichenomima** Enderlein, 1910

Type species: *Lichenomima conspersa* Enderlein, 1910.

MOCKFORD'S (1982) augmented diagnosis of *Lichenomima* included species with veins rs and m joined by a cross-vein in the hind wing and, correlated with this, "absence of a median style of the phallosome (possible exception: *L. ariasi* New) and female subgenital plate distally with a transverse sclerite, more or less separate from the main plate, and never terminating in a single process tapering posteriorly."

Thirty-four species are now assigned to this genus. Four are known only from Indonesia, all having been recorded from Java. Ten species are African, 6 are known from mainland Asia (including two occuring also in Indonesia, one of which occurs also in N. Australia), one from Japan and Fiji, one (*medialis*) from Fiji only, 8 from the Neotropics and 4 from the Nearctic.

The female genitalia of 15 species are known. Eight of them are African and 3 Oriental; 10 of these have a trilobed subgenital plate, *L. merapi* (below) exceptionally having a *Myopsocus*-like condition. *L. medialis* from Fiji has a unique form of subgenital plate, and in the three American species of which the subgenital plate is described, the apex is in the form of a broad, truncate lobe, not trilobed.

Lichenomima ampla (Smithers & Thornton)

Lichenomima ampla (Smithers & Thornton) Mockford, 1982:217.
Myopsocus amplus Smithers & Thornton, 1974: 95-97, figs. 1-3.

Distribution: Java, New Guinea, New Britain, Australia.

Specimen examined (AM): 1♀, West Java, Cibodas, Botanical Gardens, beating conifers, 1400m, 3.x.1986, IWBT.

This large mottled-winged species (Fig. 2) was described from the island of New Guinea, where it occurs from 10 m to 1500 m altitude and from the Vogelkopf in the west to the Owen Stanley range in the east, as well as in Queensland (Australia) and New Britain. Its range is now known to extend from West Java to New Britain and Queensland.

The lateral sub-lobes of the subgenital plate lack spinelets, as they do in *Lichenomima sanguensis* (New) from Nepal and Bhutan. The two species differ, however, in femur colour, *L. ampla* having a brown femur with a broad subapical paler band, and in pigmentation and sclerotisation of the apical lobe of the subgenital plate (*L. ampla* having a well-defined broad sclerotised border - see Fig. 3 from Cibodas female).

Lichenomima fenestrata Enderlein

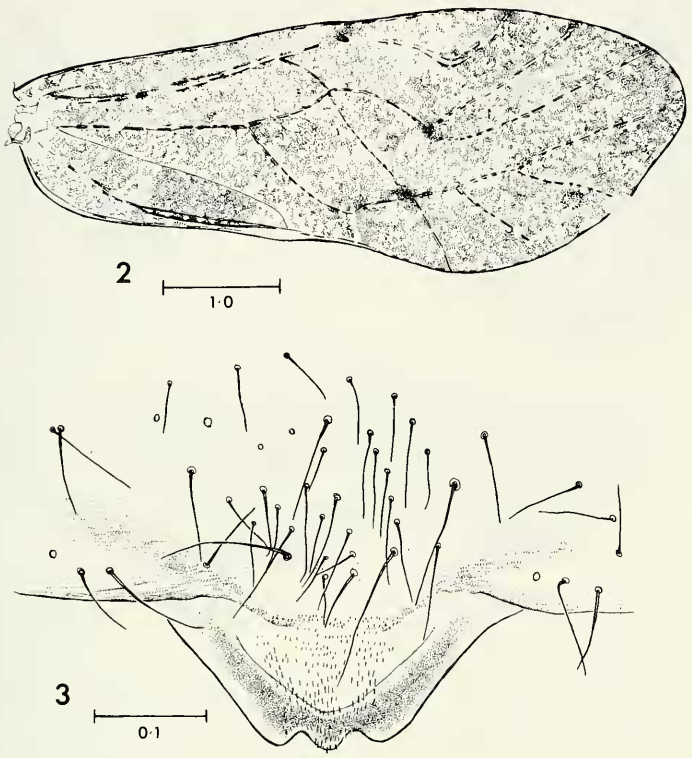
Lichenomima fenestrata Enderlein, 1926: 62.

Distribution: Central Java (Semarang, Aug).

Enderlein provided no illustrations nor genitalic information on his specimen (a male); its distinction from other described species cannot clearly be ascertained until the type is available for study.

Lichenomima merapi Thornton n.sp.

Female. *Coloration* (after 1 year in alcohol): Head buff, marked with brown as Fig. 4; frons with bell-shaped buff area surrounded by brown band; genae brown, buff adjacent to postclypeus continuing as a band below antennal socket, and a small buff mark near ventral margin. Maxillary palp brown, apical segment dark brown, basal segment pale brown. Scape and pedicel brown, f_1 pale brown with short darker ring subapically, shorter white ring apically, f_2 brown. Thoracic terga brown with buff margins. Within brown area



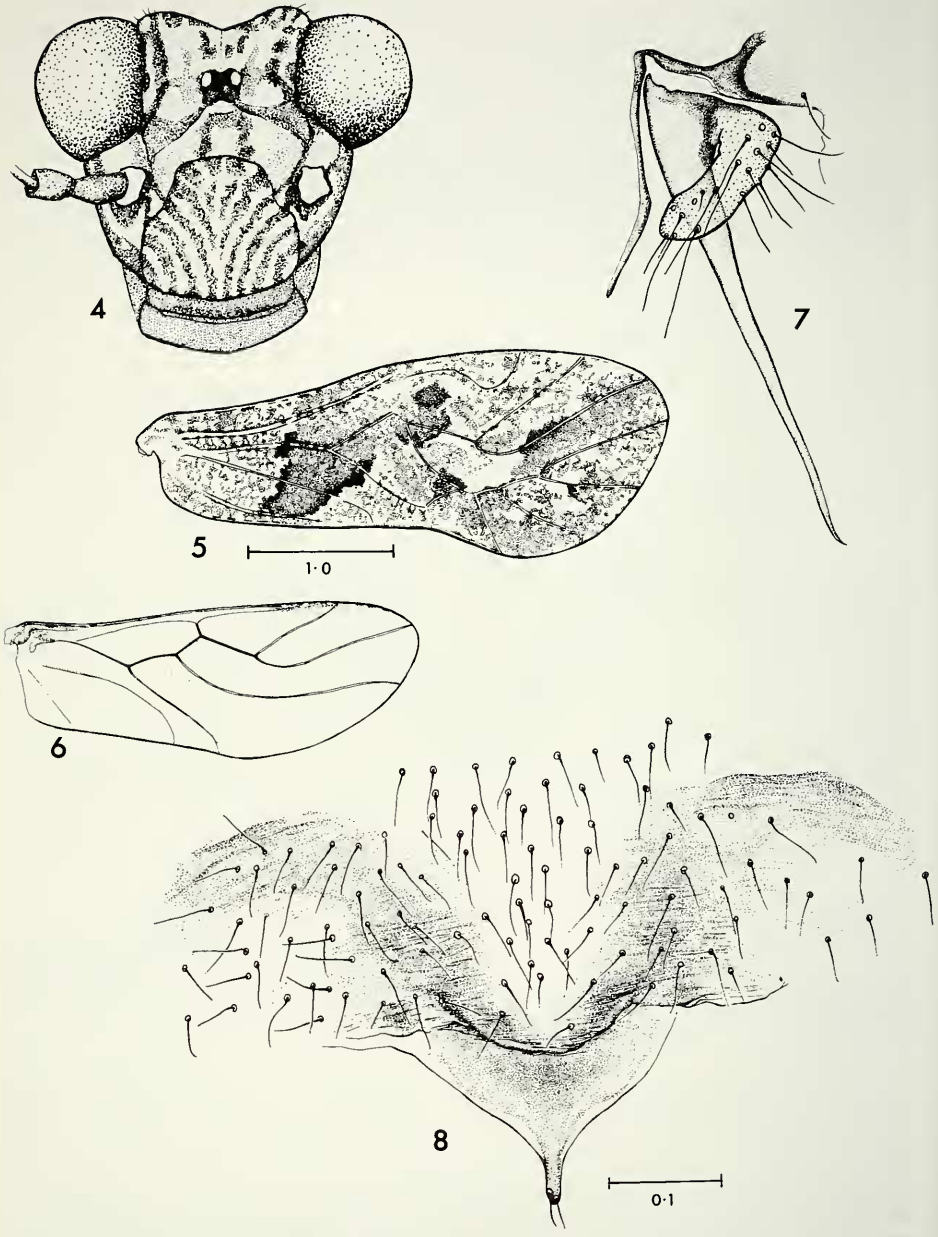
FIGS. 2-3.

Lichenomima ampla (Smithers & Thornton), female from Cibodas. 2 - fore wing, 3 - subgenital plate. (Scales in mm.)

of each mesothoracic dorsum 4 or 5 small circular buff spots, and transverse buff line anterior to posterior margin; thoracic pleura brown. Legs: coxa and trochanter brown; femur brown with subapical buff ring; tibia pale brown, dark at extreme apex; t_1 pale buff, t_2 and t_3 dark brown. Fore wing (Fig. 5) with discernible dark basal transverse fascia and contrasting dark and light pigment clouds.

Morphology. IO:D = 2.0. (Ratio of interocular distance to eye diameter, obtained here and in other descriptions by the method of Badonnel, as described in BALL 1943). Ctenidia on basal hind tarsal segment: 20. Fore wing (Fig. 5) small, pterostigma markedly rounded apically, areola postica fused with media for a distance. Hind wing as Fig. 6. Gonapophyses (Fig. 7): outer valve parallel-sided, setose; ventral valve bent medially at about half way along length. Subgenital plate (Fig. 8) narrow distal lobe fairly short, not sharply marked off from more basal part of plate, with one terminal and one subterminal seta (in both specimens dissected). Paraproct with a field of 26 trichobothria.

Material examined. *Holotype* ♀: Central Java, slopes of Gunung Merapi, near Kaliurang, 1000m, 19.I.1988, IWBT, (ZMB). Paratypes: 2 ♀, same data (AM and MHNG). 3 nymphs, same data (ZMB, AM, MHNG).



FIGS. 4-8.

Lichenomima merapi female. 4 - head, 5 - fore wing, 6 - hind wing, 7 - gonopophyses, 8 - subgenital plate. (Scales in mm. Figure 4 not to scale. Figs. 5 and 6, and 7 and 8, to common scales).

Although following MOCKFORD (1982), this species is assigned to *Lichenomima* on hind wing venation, its subgenital plate is clearly of the type included in Mockford's rediagnosis of *Myopsocus*. It is thus an exception to the correlation between hind wing venation and subgenital plate structure noted by Mockford, and could with equal justification be placed in *Myopsocus*.

Lichenomima sumatrana (Enderlein)

Lichenomima sumatrana (Enderlein) Enderlein, 1910 : 66.
Myopsocus sumatranus Enderlein, 1907a : 87; Enderlein, 1907b: 120-121.

Distribution: Sumatra (Sukaranda : Jan), West Java (Batavia: Feb, Apr, Jul, Aug), Central Java (Semarang: Dec), ? Thailand (Thoen : Dec).

Enderlein provided no illustrations nor genitalic information on this species, but the large size (fore wing almost 7 mm long) and pinkish colour of the pigment patch of the pterostigma are features of the description that led KUWAYAMA (1961) to ascribe the Thailand female to this species. Unfortunately Kuwayama did not describe the genitalia.

Genus **Myopsocus** Hagen, 1866

Type species: *Psocus unduosus* Hagen, 1859 : 201.

MOCKFORD (1982) noted that correlated with the fusion of veins rs and m in the hind wing were: "1) phallosome generally with a median style (known exceptions: *M. aldabrensis* New), *M. minor* (New & Thornton), *M. pallidus* (Smithers), *M. speciosus* (Smithers) and *M. splendidus* (Badonnel); 2) female subgenital plate terminating in a process tapered distally and with two large setae at the tip plus smaller setae in some species".

Over 90 species are now assigned to this genus (see MOCKFORD 1982, SMITHERS 1985), 8 (or 9?) from Indonesia (with 5 of these being recorded from Java). [We are unable to determine whether the locality of *M. loriai* ("Kapa kapa", in northern New Guinea) is within the Indonesian part of the island or not].

In about 60 species the female genitalia have been described. In all but one of these, the female subgenital plate has a narrow apical extension, and, except in *M. toxeres* (Smithers & Thornton) from New Guinea (in which the apex is bare), this bears at least a terminal pair of setae. *M. congolensis* (Badonnel) has an unusual subgenital plate; there is no narrow apical process.

In some 50 species the male genitalia are described. In 32 the phallosome is a closed ring with a median internal style, in 9 the ring has no style, in 6 the frame is open but the style is present, in 4 the frame is open and there is no style. In *M. ornata* (New, 1973) (Nigeria) the frame is complex with a divided style, and in the type species, *M. unduosus*, the frame is Y-shaped with a long median style projecting anteriorly beyond the frame. The hypandrium is shallowly lobed in the majority of species (over 30), but in 7 (from Africa, Madagascar, Malaya, Australia and Fiji) it bears large projecting lateral processes. In *M. australis* Brauer (Australia, New Zealand, Solomons, Norfolk I.) and *M. hickmani* Smithers (Tasmania) the hypandrium bears a complex posterior bow-shaped sclerite connected to the main plate by a narrow isthmus, recalling the condition in *Lichenomima*

pattoni (Datta) from India. The hypandrium of *M. alticola* (Thornton) from Bali has a narrow apical projection, and in *M. pallidus* (Smithers) from Madagascar there is an unusual large, curved, notched posterior process. There is no correlation between the character states of phallic frame and hypandrium.

In general, the genus as now recognised differs from *Lichenomima* in having a median style in the phallosome frame and a narrow setose apical process on the subgenital plate, as well as in hind wing venation (see Table 1).

TABLE 1

Diagnostic features of genera of the Myopsocidae

	fore wing posterior apical margin	junction of veins rs and m fore wing	phallosome	hypandrium	subgenital plate	other features
Myopsocus unduosus	normal	fused	Y-shaped, median style longer than frame	trapezium shaped, 2 apical clusters of thick setae	not known	
Other species now placed in *Myopsocus* End. (= *Rhaptoneura* End., *Phlotodes* End.)	normal	fused	closed ring with or without median style no longer than frame	simple	with narrow tapering terminal process bearing setae at or near apex	
Lichenomima End.	normal	cross-vein	elongate, no median style	simple	transverse distal sclerite, no terminal tapering process (*L. medialis* pointed, flat apically with fringe of many strong setae)	
Mouldsia Smithers	normal	fused	closed frame, median style divided apically	sclerotised, spiculate	short setose tapering distal process	ocelli lacking, fore wing narrow, 2 flaps on 9th tergite of ♂
Lophopterygella End.	scalloped	cross-vein (2 spp. fused)	closed frame of distinctive shape	sclerotised short broad apical lobe setose or bare	short broad truncate apical lobe incipiently bi-lobed with 2 setae or bare	
Smithersia n.g.	normal	fused	closed ring, no median style, posterior U-shaped extension	sclerotised, complex, lateral groups of long narrow spine	tapering to short rounded apex	fore wing narrow

Myopsocus apicalis (Thornton) n.comb.

Phlotodes apicalis Thornton, 1984 : 162

Distribution: Bali (Jul, Dec).

Described from Bali (both sexes) this species is here transferred to *Myopsocus*, following MOCKFORD (1982). It appears to be a somewhat aberrant member of Group I of SMITHERS & THORNTON (1974).

Myopsocus corticola Vaughan *et al.*

Myopsocus corticola Vaughan, *et al.*, 1991:155

Distribution: West Java (Carita : Aug).

This species, known only from the male, is an exception to the correlation between the condition of the hind wing rs-m junction (in this species fused) and the presence/absence of a median phallosome style (absent), additional to those noted by MOCKFORD (1982). Its placement in *Myopsocus/Lichenomima* is thus at present equivocal. Discovery of females should help to resolve this; as noted by VAUGHAN *et al.* (1991), there is a possibility that this specimen is the male of *M. lombokensis* (see below).

Myopsocus dentatus (Smithers & Thornton)

Myopsocus dentatus (Smithers & Thornton) Mockford, 1982 : 215.

Phlotodes dentata Smithers & Thornton, 1974: 114

Distribution: Irian Jaya (Kamo Valley : Aug).

Known only from a single male taken at 1500 m, this species is placed in Group II by SMITHERS & THORNTON (1974). Slight scalloping of the apical fore wing margin is discernible, but the phallosome has a median style and the hypandrium lacks a rectangular setose lobe; placement in *Lophopterygella* on the basis of the slightly sinuous fore wing margin is not warranted.

Myopsocus javensis Vaughan *et al.*

Myopsocus javensis Vaughan, *et al.*, 1991:157

Distribution: West Java (Ujung Kulon : Nov).

Known only from the male. The condition of the junction of veins rs and m in the hind wing in the type is equivocal (the veins meet at a point in both hind wings). The phallosome is *Lichenomima*-like in that it lacks a median style, and following MOCKFORD (1982) strictly, the species should thus be placed in *Lichenomima*. Bearing in mind the several exceptions noted by Mockford (see above under *M. corticola*), however, for the time being it is considered wiser to leave the species in *Myopsocus* until information on female genitalia (and a better appreciation of hind wing venation) becomes available.

Myopsocus kolbei Enderlein

Myopsocus kolbei Enderlein, 1903: 302-303; Mockford, 1982 : 214

Phlotodes kolbei (Enderlein) Enderlein, 1910 : 67; Smithers, 1967 : 123; Smithers & Thornton, 1974: 103.

Distribution: Irian Jaya (month not specified); New Guinea (Jul, Sep); New Britain (Nov).

Specimens of both sexes from New Guinea were identified as this species (described from Irian Jaya without genitalic information) on the basis of fore wing pattern. It was placed in Group II by SMITHERS & THORNTON (1974).

Myopsocus lombokensis (Thornton) n.comb.

Phlotodes lombokensis Thornton, 1984 : 164

Distribution: West Java (Ujung Kulon : Oct, Nov); Lombok (Jul).

This species is known only from the female. It is here tranferred to *Myopsocus*. As noted by VAUGHAN *et al.* (1991) it may prove to be conspecific with *M. corticola*, and further field work is needed to decide this matter. It is closest to Group I of SMITHERS & THORNTON (1974), but the groups are not well-defined on female characters and if *M. corticola* (above) is indeed the male of this species, it cannot be included in either Groups I or II.

Myopsocus longigena (Enderlein)

Myopsocus longigena (Enderlein) Smithers, 1985 : 265

Phlotodes longigena Enderlein, 1926 : 63

Distribution: West Java (Jakarta : Jul).

Enderlein's description (from a single male) does not include an illustration of the fore wing, nor a description of genitalia.

Myopsocus loriai Ribaga

Myopsocus loriai Ribaga, 1908: 107-108; Smithers, 1985 : 266

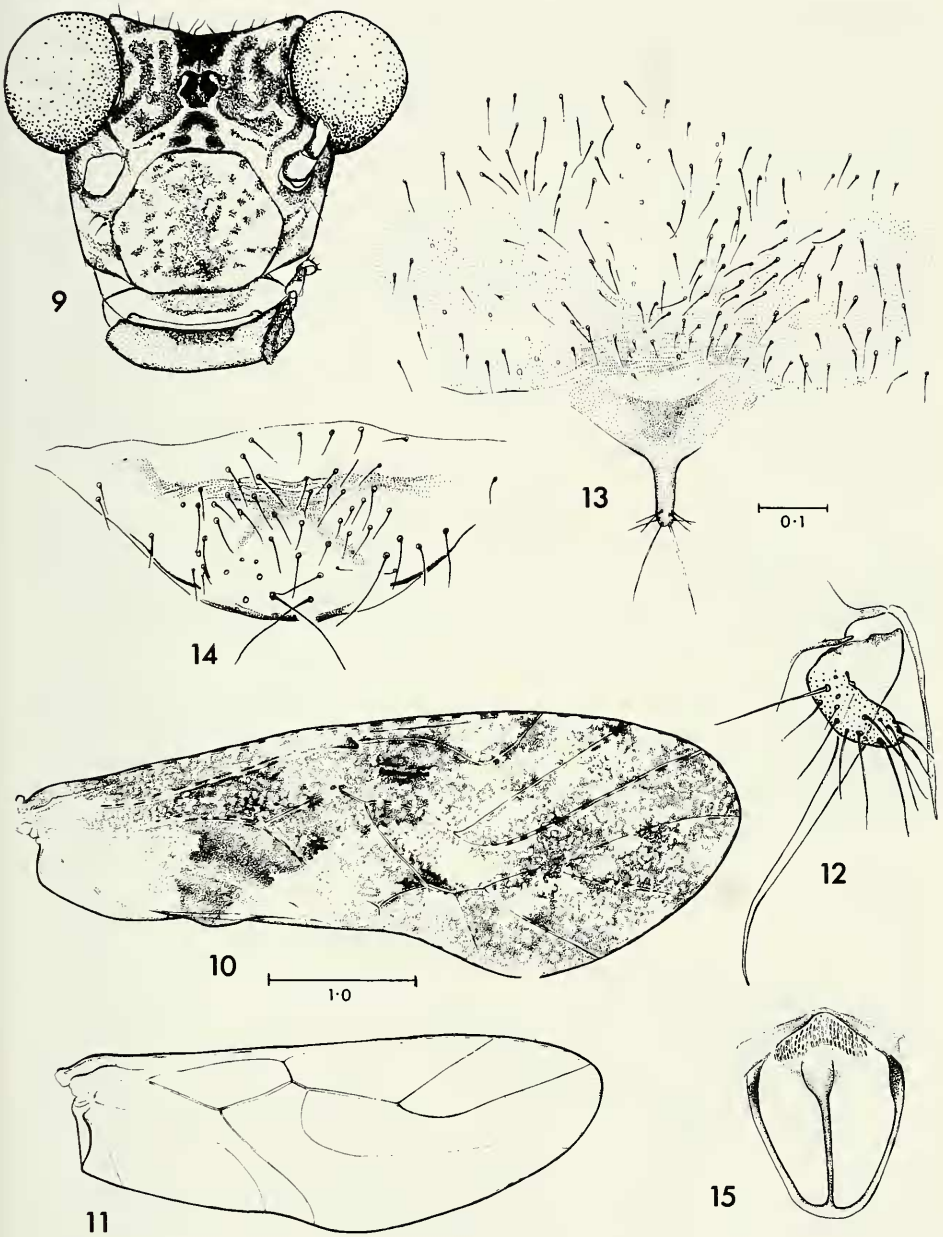
Phlotodes loriai (Ribaga) Enderlein, 1910 : 67

Distribution: New Guinea (Kapakapa : May, Jun).

The description includes a figure of the fore wing. This species was not collected in New Guinea by SMITHERS & THORNTON (1974).

Myopsocus spatulatus Thornton n.sp.

Female. – *Coloration* (after 1 year in alcohol). Eyes when fresh pale greenish with dark stripes. Head (Fig. 9) generally cream with dark brown marking predominant on vertex; frons with dark brown mark medially, otherwise predominantly cream; postclypeus cream, brown spots of striae very small and sparse but merging medially; gena largely cream, an L-shaped brown mark below orbit; labrum dark brown. Maxillary palps brown, apical segment dark brown. Scape and pedicel brown. Mesothoracic pronotum dark brown, a cream spot each side posteriorly; nota cream posterolaterally, brown anteromesially, brown area with 4-5 small circular cream spots; scutellum cream.



FIGS. 9-15.

Myopsocus spatulatus 9 - 13 female: 9 - head, 10 - fore wing, 11 - hind wing, 12 - gonopophyses, 13 - subgenital plate. 14 - 15 male: 14 - hypandrium, 15 - phallosome. (Scales in mm. Figure 9 not to scale. Figs. 10 and 11, and 12 - 15, to common scales).

Metathoracic terga and scutellum cream. Thoracic pleura dark brown. Legs: coxa and trochanter brown; femur dark brown with buff subapical band; t_1 buff, shading to brown basally and apically; rest of tarsus dark brown. Fore wing (Fig. 10) with distinct basal dark fascia, broken subapical hyaline fascia discernible parallel to and some distance from wing margin. Hind wing (Fig. 11). Abdomen dorsally buff, ventrally grey-brown, darkening laterally.

Morphology. IO:D = 1.6. Ctenidia on basal hind tarsal segment: 22. Gonapophyses (Fig. 12) with relatively small outer valve, ventral valve short, straight. Subgenital plate (Fig. 13) tapering to clearly delimited fairly short narrow apical lobe bearing two long stout terminal setae and 6 finer setae (one third length of long terminal setae) subapically. Paraproct with field of 26 trichobothria and 1 seta without rosette socket.

Male. – *Coloration*. As female.

Morphology. 10:D = 1.0. Ctenidia on basal hind tarsal segment 22. Hypandrium (Fig. 14), simple, very shallowly trilobed, a pair of long stout setae subapically. Phallosome (Fig. 15) a closed ring with median style spatulate apically. Paraproct with field of 27 trichobothria and two setae without rosette sockets.

Material examined. - *Holotype* ♂: West Java, Cibodas, Botanical Garden, beating, 1400 m, 3.X.1986, IWBT (ZMB). *Allotype* ♀ (ZMB), paratype ♂: same data as holotype (AM). Other specimens examined: ♀, same locality as holotype, north slope Gunung Gede, submontane forest, 1600 m, 16.ii.1987, IWBT (AM); ♂, 2♀, Cibodas area, 27.xi.1987, C. Lienhard (MHNG); ♀, Cibodas, Botanical Garden, captured as nymph (MHNG); 1n, 25.xi.87, C. Lienhard (MHNG).

This species falls into Group I of Smithers & Thornton (1974).

In the spatulate median style of the phallosome it is similar to *M. platyvalvula* (Smithers & Thornton) from the New Hebrides (Vanuatu), whilst in female genitalia it is similar to *M. punctatus* (Thornton, Lee & Chui) from Micronesia, *M. punctatoides* (Thornton) from Fiji and Tonga, and *M. lombokensis* (Thornton) from Lombok. From the two first species *M. spatulatus* differs in lacking prominent pigment spots in the apical

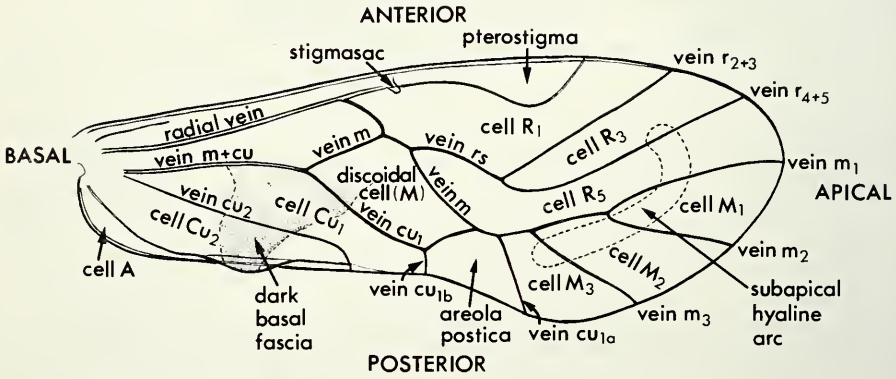


Fig. 16.

A diagrammatic myopsocid fore wing showing veins, cells and features to which the key to *Myopsocus* species refers.

cells of the fore wing. It differs from *M. punctatoides* in that the pair of apical setae of the subgenital plate are decidedly longer than the other setae of the median process, and from *M. lombokensis* in lacking the dark spot posterior to the pterostigma in the fore wing. It appears to be a mountain form, not having been collected in the lowlands.

We provide a field key (based largely on fore wing pattern) to Indonesian species of *Myopsocus* and those of the non-Indonesian part of the island of New Guinea (asterisked). *M. mjorbergi* (Karny) from Sarawak, which may well occur in Kalimantan, and *M. longigena* are not included since no figures are provided in the descriptions, which are inadequate for use in the key. Figure 16 illustrates cells, veins and characteristics of the fore wing that are mentioned in the key. Where several specimens are available, e.g. *lombokensis*, *spatulatus*, *kolbei* (and several New Guinea and New Caledonian species in SMITHERS & THORNTON 1974), careful study of the distribution of intensely pigmented patches and hyaline areas of the fore wing shows that subtle characteristics of fore wing pattern are consistent; thus the key is probably of value even for the several species that are known from only one specimen.

Field Key to Indonesian species of *Myopsocus*

1. Cell R_5 with at least one hyaline area in basal half extending over almost whole width of cell and at least as long as broad 2
   Cell R_5 without such a hyaline area 7
2. Basal half of cell R_5 with two separate similar circular hyaline areas .. *M. apicalis*
   Basal half of cell R_5 with a single hyaline area 3
3. Cell R_5 > two thirds hyaline ..... *M. marginatus**
   Cell R_5 < half hyaline 4
4. Hyaline areas fills basal third of cell R_3 extends over width of cell and is longer than broad ..... *M. preclarus**
   Hyaline area does not fill basal third of cell R_3, hyaline area narrow or not extending to base of cell 5
5. Pigment in cell R_5 adjacent to areola postica much darker than that within areola postica ..... *M. spatulatus*
   Pigment in cell R_5 adjacent to areola postica of same intensity as that within areola postica 6
6. Cell M_3 with an elongate hyaline area passing from near base of vein m_3 towards outer margin of cell ..... *M. fenestratus**
   Cell M_3 without such an elongate hyaline area ..... *M. venustus**
7. Pterostigma with distinct ovoid hyaline or very pale area filling distal half ..... *M. lombokensis*
   Pterostigma not as above 8
8. Dark basal fascia in cells Cu_2 and Cu_1 not extending into base of discoidal cell ..... *M. javensis*
   Dark basal fascia extends into discoidal cell 9
9. Around apical margin of fore wing a pigmented band as wide as 1/2 length of pterostigma and with irregular basal margin, clearly darker than pigment in apical half of pterostigma 10
   No such marginal band, or if so, no darker than pigment in apical half of pterostigma 11
10. Basal half of cell Cu_2 hyaline, with small pigmented area and pigment spots; outer margins of medial cells lacking small semilunar areas ..... *M. corticola*

Basal half of cell Cu_2 pigmented brown, with small hyaline areas and hyaline spots; medial cells each with a small semilunar hyaline area in middle of outer margin ..... *M. loriai*

11. Approximately half-way along vein m_1 a small cloud of darker pigment with adjacent small hyaline more basal area 12
    Vein m_1 without such a cloud 16
12. Vein m_2 with dark pigment cloud as on vein m_1 13
    Vein m_2 without dark pigment cloud as on vein m_1 ..... *M. pilipes**
13. Vein r_{4+5} without a distinct cloud on vein m_1, pigment in cell R_5 (as dark as cloud on vein m_1) adjacent to base of radial fork 14
    Vein r_{4+5} with distinct darker pigment cloud as on vein m_1, no pigment as dark as this cloud in cell R_5 adjacent to base of radial fork 15
14. Apical margin of wing and vein m+cu with many adjacent evenly spaced pigmented and hyaline areas; hind femur brown, darker apically, tibia brown; phallosome a closed frame ..... *M. toxeres**
    Apical margin of wing and vein m+cu with irregular pigmented and hyaline areas; hind femur brown with preapical pale band, tibia pale, dark distally; phallic frame open posteriorly ..... *M. dentatus**
15. Narrow hyaline areas across veins m_1, m_2 and m_3 separated from one another by very short mottled areas; no small dark spot about size of stigmasac just posterior to it; apical half of femur darkly pigmented ..... *M. rimosus**
    Hyaline areas across medial branches separated from one another by stretches of mottled pigment as long as or longer than hyaline areas themselves; small dark spot about size of stigmasac just posterior to it; apical half of femur pale with dark brown apical band ..... *M. kolbei*
16. Small dark pigmented area immediately anterior to apex of areola postica 17
    Areola postica apex without more darkly pigmented area immediately anterior to it 19
17. Vein r_{2+3} with >4 narrow hyaline areas crossing it, area immediately posterior to basal posterior margin of pterostigma hyaline ..... *M. maculatus**
    Vein r_{2+3} not crossed by narrow hyaline areas, area posterior to basal posterior margin of pterostigma mottled 18
18. Male epiproct triangular, with central rectangular rugose field; hypandrium rounded, with pair of internal pointed flanges; phallosome closed, median style projecting beyond frame, style 6 times as long as broad ..... *M. scabiosus**
    Male epiproct circular, no central rugose field; hypandrium shallowly trilobed, no internal flanges; phallic frame open, median style 12 times as long as broad but not projecting beyond arms of frame ..... *M.peltatus**
19. Basal border of basal fascia of fore wing not extending to radial vein, fascia edges parallel; no continuous irregular narrow subapical hyaline arc across medial cells; femur pale, apical tarsal segments pale with darker apices ..... *M. bomasa**
    Basal border of basal fascia of fore wing extends to radial vein, fascia edges diverge anteriorly; cells M_1, M_2, M_3 traversed by continuous narrow irregular subapical arc; femur dark brown with pale subapical band, apical tarsal segments dark brown ..... *M. gressiti**

Smithersia Thornton n.g.

Type species: *Psocus hermosus* Banks, 1920 : 300, as redescribed (and lectotype designated) by SMITHERS (1979) from Banks' type material.

DIAGNOSIS. - Fore wing fairly narrow; hind wing with veins rs and m connected by a short fusion; hypandrium complex, apical lobe divided distally, with lateral groups of narrow curved spurs; phallosome a closed ring without median style and with large apical bifid extension; female subgenital plate with distinct apical lobe tapering convexly to a short rounded apex, no long narrow apical process or apical setae (except possibly a pair in *Smithersia angusta*).

Apart from *Smithersia hermosa* Banks (n. comb.), from Singapore, three other species are assignable to this genus: *Smithersia newi* [= *Myopsocus hermosus* (Banks) of New (1975), see below] (Singapore and West Java), *Smithersia angusta* (Vaughan *et al.*) (Sumatra) and *Smithersia hermosoides* (Vaughan *et al.*) (Sumatra).

The genus differs from all known myopsocid genera in the complex of spurs on each side of the hypandrium lobe, the large bifid posterior extension of the phallosome and the sclerotized patches of the ninth tergite of the female. It also differs from *Mouldsia* Smithers in possessing ocelli and lacking paired lobes on the male epiproct, from *Lichenomima*, in that veins rs and m of the hind wing are fused for a distance, from *Lophopterygella* Enderlein in lacking scalloping along the margins of the outer fore wing cells and from *Myopsocus* Hagen (*sensu* Mockford) in lacking the narrow apical process of the subgenital plate (see table 1).

Smithersia angusta (Vaughan *et al.*) n.comb.

Myopsocus angustus Vaughan, *et al.*, 1991:159

Distribution: Sumatra (Liwa : Sep)

Male unknown, one female only.

Smithersia hermosoides (Vaughan *et al.*) n.comb.

Myopsocus hermosoides Vaughan *et al.*, 1991:158

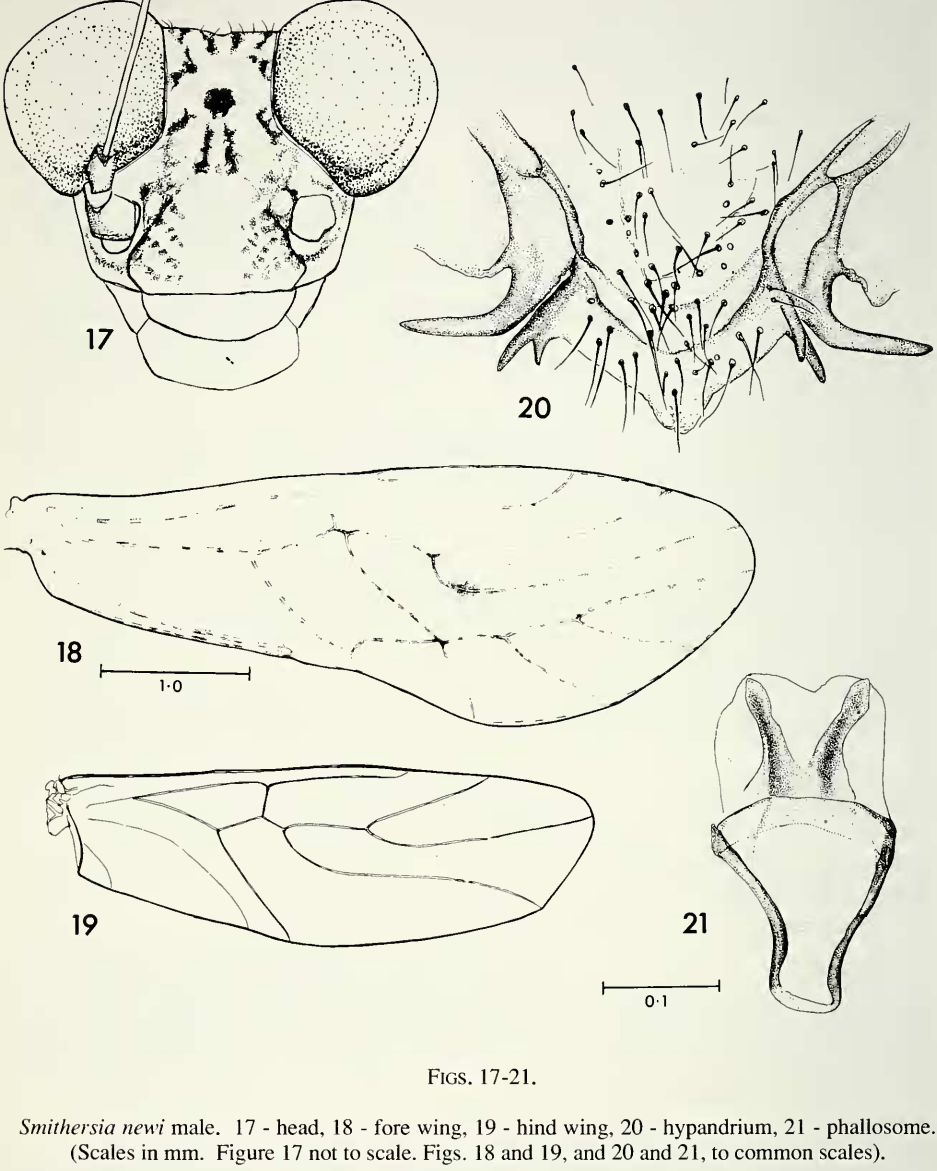
Distribution: Sumatra (Liwa : Sep)

Female unknown, one male only.

The above two species were taken at Liwa, in Barisan Selatan National Park, southern Sumatra, a week apart. It is unlikely, however, that the two specimens represent one species. The fore wing patterns are quite different, and the type species, which has a fore wing pattern close to that of *S. hermosoides*, is not sexually diomorphic in this regard.

Smithersia newi Thornton n.sp.

Male. – *Coloration.* Head (Fig.17) predominantly cream, vertex and frons markings very dark brown, sparse; ocellar protuberance black; clypeal striae brown, short, leaving a very broad cream medial band; genae cream, dark brown adjacent to antennal socket; labrum cream. Scape buff; pedicel brown; flagellar segments buff, darkening slightly gradually towards apices. Maxillary palp very pale buff except apical segment pale brown. Fore wing (Fig. 18) pigment faint brown except dark over vein r_{4+5} near its base, pterostigma unpigmented. Hing wing hyaline (Fig. 19). Mesothoracic pronotum with 4



FIGS. 17-21.

Smithersia newi male. 17 - head, 18 - fore wing, 19 - hind wing, 20 - hypandrium, 21 - phallosome. (Scales in mm. Figure 17 not to scale. Figs. 18 and 19, and 20 and 21, to common scales).

dark grey longitudinal bands on anterior face, dorsally with 2 brown marks and dark grey bands along posterior margins. Mesothoracic dorsa brown, fading to broad cream margins, scutellum pale buff with small grey-brown triangle medially. Metathoracic dorsa and scutellum as mesothorax. Thoracic pleura cream with some grey-brown granulated pigment. Legs: cream, except apical tarsal segments brown. Abdomen cream ventrally, dorsally with lateral grey-brown granulated longitudinal bands.

Morphology. IO:D = 0.8, eyes large. Ctenidia on basal hind tarsal segment: 23. In fore wing (Fig. 18) areola postica fused with media for a very short distance; in hind wing (Fig. 19) rs and m fused for a distance, wing margin slightly lobed at end of vein m (not in other wing, nor in other specimen), hind wing broadest in mid-wing. Hypandrium (Fig. 20) with trapezoid apical lobe, each side a bifid spur and more laterally a longer sharply bent stouter spur, tips of hypandrial spurs not sharply pointed; medial tract of fairly long setae. Phallosome (Fig. 21) a closed ring of characteristic shape, with large bifid terminal sclerotised extension. Paraproct with field of 29 trichobothria and 1 seta without rosette socket.

Female. – *Coloration*. As male, except pterostigma of fore wing (Fig. 22) with pale brown cloudiness.

Morphology. IO:D = 1.6. Ctenidia on basal hind tarsal segment: 24. In fore wing (Fig. 22) areola postica meets media at a point; hind wing (Fig. 23) as male but of normal shape. Gonapophyses (Fig. 24) with dorsal valve strongly curved. Subgenital plate (Fig. 25) sclerotization of disc as narrow bands reflected distally. Gonapore plate (Fig. 26) with four small distinctive sclerotized areas, those of the anterior pair underlying triangular flaps. Epiproct chactotaxy as that of *S. hermosa* except three small setae, not two, on apical margin. Paraproct with oval field of 31 trichobothria.

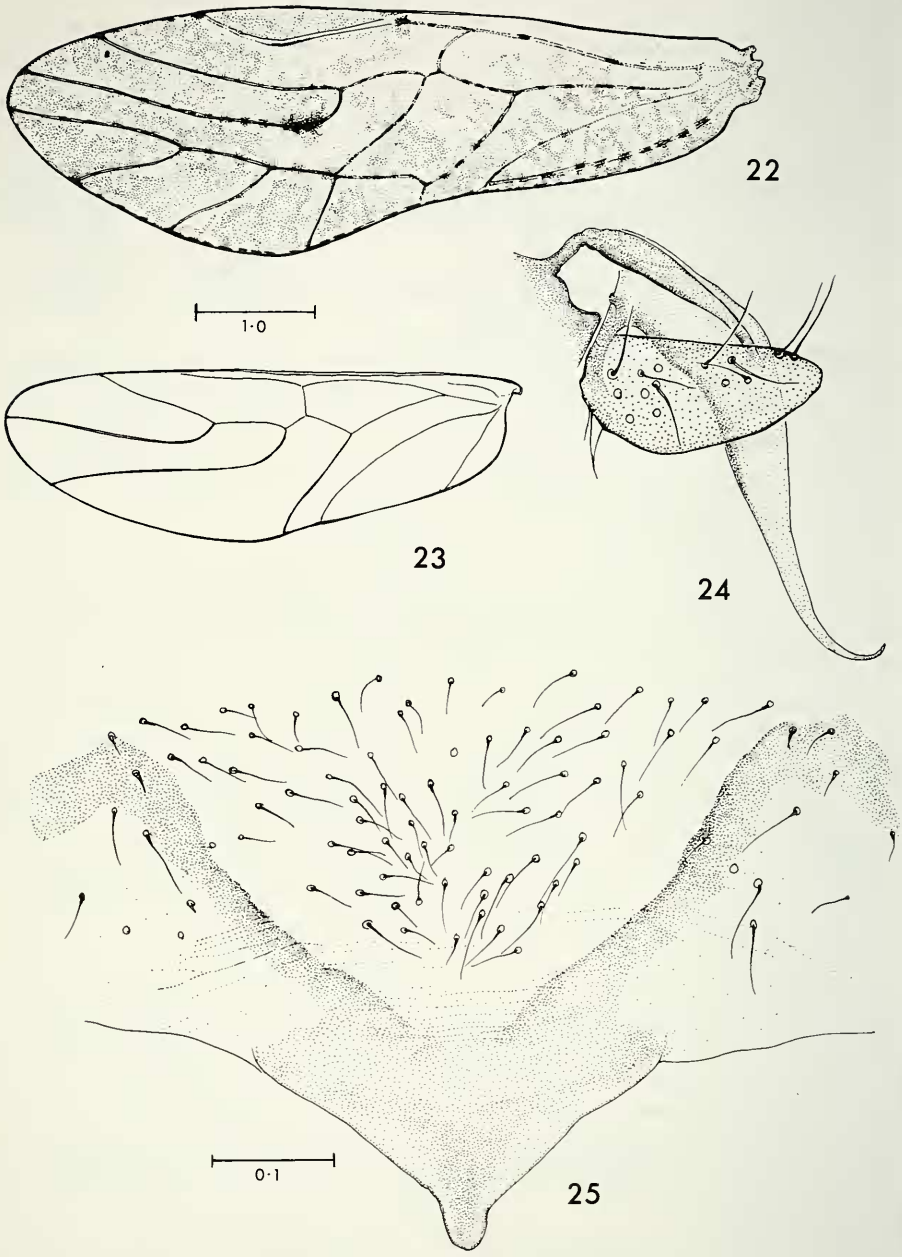
Material examined. *Holotype* ♂: West Java, Cibodas, Botanical Garden, 1300 m, 3.X.1986, IWBT (ZMB). *Allotype* ♀: Cibodas, 1400-1550 m, sweeping vegetation in montane *Lithocarpus-Castanopsis* forest, 3-6.xi.1989, Lobl Agosti and Burckhardt (ZMB). Paratype ♂: data as holotype (AM). Other specimens: 2♂, Singapore, Bukit Timah Botanical Reserve, 27.V.1967, D.H. Murphy (in AM) [assigned to *Psocus hermosus* (Banks) by New 1975].

Smithers (1979) noted that figures (New 1975) of a Singapore specimen (see above) assigned by New to *Psocus hermosus* (Banks) showed a myopsocid wing with psocid genitalia. Smithers provided a redescription of the *Psocus hermosus* female from Banks' type material, designated a female lectotype, and described the male. We have seen the specimens examined by New, and they are not conspecific with *hermosus* as redescribed by Smithers but are referable to the species described above. In Smithers' drawing of the male genitalia of Banks' type material, the median lobe of the hypandrium appears to carry two spurs each side, not one as stated in the text of the redescription, and these may be fused at their bases, thus being similar to the condition in *S. newi*.

S. newi differs from *S. hermosa* in the following: head pattern, lack of darker pigment beside veins associated with areola postica apex and greater extent of pigment in cells R_3 and R_5 in fore wing; hypandrial spurs sharply pointed, outer spur longer than in *S. hermosa* and more sharply curved, apical lobe of hypandrium narrow; posterior extension of phallosome with arms diverging more widely; shape of sclerotized bands on disc of subgenital plate (not hook-shaped in *S. hermosa*), pattern of sclerotization of spermapore plate. *Smithersia hermosoides* (above) lacks the long, stout, sharply bent outer hypandrial spine seen in *S. newi*, and *Smithersia angusta* (above) differs from *S. newi* in having more extensive unpatterned areas in the fore wing and in the shape of the sclerotized arms on the subgenital plate disc.

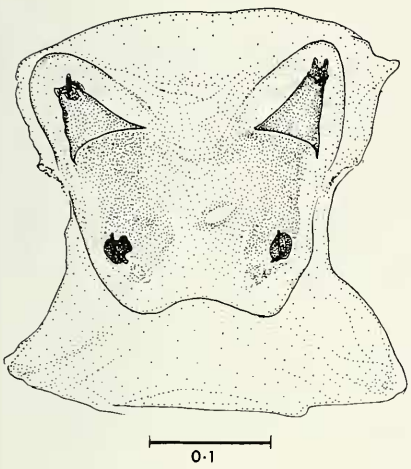
Field key to species of *Smithersia*

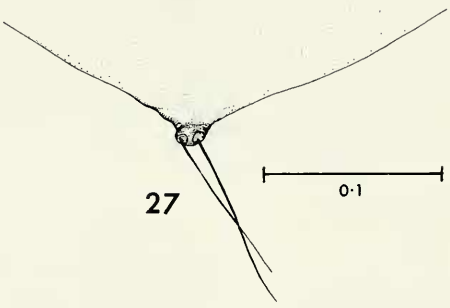
1. In fore wing, pigment over vein r_{4+5} near its base clearly darker than all other pigment clouds 2



FIGS. 22-25.

Smithersia newi female. 22 - fore wing, 23 - hind wing , 24 - gonapophyses, 25 - subgenital plate. (Scales in mm. Figs. 22 and 23, and 24 and 25, to common scales.





FIGS. 26-27.

26 - *Smithersia newi* female, gonopore plate. 27 - *Myopsocus tropicus* (Smithers), type specimen, apex of subgenital plate. (Scales in mm.).

In fore wing, some other pigment clouds as dark as pigment over vein r_{4+5} near its base 3

2. Apical half of cell R_5 in fore wing covered with pigment clouds; hypandrium each side with one sharply bent spur twice the length and thickness of others ..... *S. newi*
Less than one quarter of area of apical half of cell R_5 in fore wing covered with pigment clouds; hypandrium with no lateral spur twice the length of others ..... *S. hermosoides*

3. In fore wing only the pigment at apex of areola postica and along vein m immediately basal to it is as dark as that over r_{4+5} near its base ..... *S. hermosa*
In fore wing many small clouds are as dark as that over r_{4+5} near its base ..... *S. angusta*

Genus **Lophopterygella** Enderlein, 1907b

Type species : *Lophopterygella camelina* Enderlein, 1907b : 122.

This genus is characterised by having the fore wing margin apically scalloped; rs and m in the hind wing joined by a cross-vein (except the South American *L. cincta* New and *L. albomaculata* New); female subgenital plate with an apical truncate lobe (again except the two S. American species), in some species bearing two or more setae; male epiproct with apical tongue-like process; hypandrium with a distinct small short rectanguloid setose lobe; phallosome lacking a median style or penial bulb sclerites.

Some 16 described species are currently placed in this tropicopolitan genus, including 9 from the Oriental-Australian-Pacific region, 2 from S. America, and one each

from China, Taiwan, N. America, Haiti and Africa. The two S. American species, both known only from females, stand apart from the rest, as indicated above. *Myopsocus tropicus* (Smithers) from northern Queensland, Australia, recently transferred from *Phlotodes* by SMITHERS (1985) and known only from the female, satisfies all the applicable generic criteria except hind wing venation. We have examined the subgenital plate of the type and provide a figure of the apex (Fig. 27). The apical lobe, as mentioned by Smithers, is very short and bears two long setae; when the male is discovered this species may prove to be assignable to *Lophopterygella*. Four species are currently known from Indonesia; 3 of these are recorded from Java and one undetermined species has been found as yet only on the Krakatau archipelago.

Lophopterygella antennalis Thornton, 1984

Lophopterygella antennalis Thornton, 1984: 160-162; Vaughan *et al.*, 1991:162

Distribution: West Java (Ujung Kulon : Nov), Bali (Jul).

Known from one female from Bali and one from Gunung Payung on the Ujung Kulon peninsula, the species is evidently closely related to *L. camelina* (below).

Lophopterygella camelina Enderlein, 1907

Lophopterygella camelina Enderlein, 1907b: 122-126; Vaughan *et al.*, 1989 : 88.

Festona lunata Navas, 1922 : 60; Smithers, 1967 : 121.

Distribution: Philippines, China, Taiwan, West Java (Krakatau Is. : Sep; Bogor : no month cited), Central Java (Semarang: no month cited).

This widespread species has successfully colonized the Krakatau Archipelago but has not been found in Sumatra.

Lophopterygella ridderi Vaughan *et al.*

Lophopterygella ridderi Vaughan *et al.*, 1991:161

Distribution: West Java (Carita : May)

The field of narrow spines on the apical lobe of the subgenital plate is unique in the genus as now known; the fore wing pattern is also distinctive.

? **Lophopterygella** sp.

Lophopterygella sp. Vaughan *et al.*, 1989 : 89.

Distribution: West Java (Krakatau Is. : Sep).

Detailed knowledge of genitalia of this species is limited, and the scalloping of the fore wing, characteristic of this genus, is only weakly developed. The species is only provisionally assigned to *Lophopterygella*.

Field key to Indonesian species of *Lophopterygella*

1. Fore wing with extensive hyaline areas, a single narrow broken hyaline wavy band, bordered distally by dark pigment, following shape of posterior apical wing margin and some distance from it 2
   Fore wing with hyaline areas not extensive, three separate narrow hyaline bands bordered with dark pigment or no hyaline bands 3
2. Three basal flagellar segments of ♀ with 7, 4-5 and 3 broad brown rings, (basal to more apical), ♀ subgenital plate with pair of short apical lobes separated by more than 4 times greatest width of lobes ..... *L. antennalis*
   Three basal flagellar segments of ♀ with 7-8, 8 and 6 broad brown rings, ♀ subgenital plate with pair of short apical lobes separated by less than twice greatest width of lobes ..... *L. camelina*
3. Fore wing with three narrow hyaline bands (basal, apical and mid-wing) bordered on one side by dark pigment ..... *L. ridderi*
   Fore wing without such bands ..... ? *Lophopterygella* sp. from Krakatau Is.

Genus **Mouldsia** Smithers, 1978

Type species : *Mouldsia barbarae* Smithers, 1978 : 106, described from Queensland, Australia.

In this genus ocelli are lacking, the eyes are very large in both sexes, the wings are long and narrow, in the hind wing veins rs and m are fused and the anal vein reaches only half way to the wing margin, the subgenital plate has a short setose distal process, the phallosome is a closed frame with an apically divided median style, the hypandrium is sclerotized and spiculate, and the ninth tergite of the male is heavily sclerotized and bears two lateral flaps which may overlap a median lobe.

Four species are described, from Queensland, Irian Jaya, New Britain, and the Solomons.

Mouldsia inocellata Smithers & Thornton, 1974

Mouldsia inocellata (Smithers & Thornton), Smithers, 1978 : 106.

Phlotodes inocellata Smithers & Thornton, 1974 : 115-117.

Distribution: Irian Jaya (Jayapura area : Oct).

Described from a single female. The male is unknown.

DISCUSSION

Mockford (1982) demonstrated that in the type species of *Myopsocus (M. unduosus)* not only are veins rs and m of the hind wing fused for a length, but also the hypandrium and phallosome are unique in the family in basic structure. In none of the other species of which the male is described is the hypandrium trianguloid with a pair of clusters of thick pointed setae near the apex. The peculiar Y-shaped structure of the phallic frame is approached only by *M. anomalus* (Smithers & Thornton) (Solomons), *M. scabiosus*

(Smithers & Thornton) (New Guinea), in both of which, however, the frame is closed, the Galapagos *M. chelata* (Thornton & Wong) which has no median style, and M. peltatus (Smithers & Thornton) from New Guinea. The distinction between *M. unduosus* and other species placed in *Myopsocus* appears to be of a magnitude at least comparable to that between *Myopsocus* and *Lichenomima* summarised by Mockford (1982), and we believe the genus *Myopsocus* should logically be restricted to its type species, *M. unduosus*. The other species (over 90) now assigned to the genus would then need to be reassigned elsewhere. Such a reassignment, however, must await a critical examination of the large number of species now placed in *Myopsocus*, which almost surely represent more than a single taxon of generic or subgeneric rank [compare, for example, the phallosomes of *M. maculatus* (Smithers & Thornton) and the more typical *M. gregarius* (Smithers & Thornton) or the hypandria of *M. apicalis* Thornton and *M. zealandicus* Smithers]. In 59 of the 61 species in which female genitalia are known the subgenital plate has a terminal elongate extension carrying two or more setae, in one there are no setae, and in one there is no apical process; female genitalia appear to be conservative, only *M. congolensis* (Badonnel) being unusual in this regard. The typical *Myopsocus* subgenital plate has, however, been found in one species otherwise assignable to *Lichenomima* : *L. merapi* (see above).

Following Mockford's re-examination of the type species of *Myopsocus*, the next logical step is a critical analysis of all species now assigned to the genus. This would entail re-examinations of the type species of *Phlotodes* and *Rhaptoneura*, the rankings of which may need to be restored, and an attempt to examine the genitalia of the many species described without genitalic information. Such a task is, of course, outside the scope of this work, but would be a most important contribution to the systematics of the family.

In addition to the paradoxical taxonomic distance of the type species of *Myopsocus* from other species now assigned to that genus, differences in subgenital plate between African species of *Lichenomima* and their congeners in the Americas, in hypandrium within the species now placed in *Myopsocus*, and between the South American *Lophopterygella* species and the remaining species of that genus, together with the equivocal generic placements of such species as *Lichenomima merapi* (*? Myopsocus*), *Myopsocus tropicus* (? *Lophopterygella*), *Myopsocus javensis* (? *Lichenomima*) and *Lichenomima medialis* suggest that a revision of the whole family would now be appropriate.

Smithers & Thornton (1974, 1981) noted that two definable groups (I and II) have representatives on the Melanesian arcs as far as Fiji (Smithers & Thornton 1981 figures 7, 8 and 10). It is not surprising that species belonging to these groups have been found in Indonesia (Group I - *apicalis* (Bali), *?lombokensis* (Java, Lombok), *spatulatus* (Java); Group II - *dentatus* and *kolbei* (Irian Jaya).

Anknowledgments

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